

CLAIMS

1. Production method of lactose from whey or a permeate resulting from the ultrafiltration of whey, this whey and permeate comprising monovalent Na^+ and K^+ cations, monovalent Cl^- anions, multivalent Ca^{2+} and Mg^{2+} cations and multivalent inorganic anions, such as phosphate anions and/or organic acid anions able to form complexes with said multivalent cations, such as lactate and citrate, characterized in that it comprises the operations:

- 10 (a) of replacement of at least a part of said multivalent cations of the whey or permeate by monovalent metal cations, in order to obtain a whey or permeate depleted in multivalent cations,
- 15 (b) of replacement of at least a part of the multivalent inorganic anions and organic acid anions of the whey or permeate by monovalent anions non-able to form complexes with the multivalent cations, this operation (b) being
20 performed either simultaneously to operation (a), in which case a whey or permeate depleted in multivalent inorganic anions, in organic acid anions and in multivalent cations is obtained, or before operation (a),
25 in which case a whey or permeate depleted in multivalent inorganic anions and organic acid anions is obtained, and
- 30 (c) of crystallization of said whey or permeate resulting from the preceding operations, and depleted in multivalent inorganic anions, in organic acid anions and in multivalent cations, in order to obtain crystallized lactose and a mother liquor enriched in monovalent metal cations, this crystallization being
35 preceded, if necessary, by an operation

of concentration of said whey or permeate to the desired degree.

2. Method according to claim 1, characterized in that it further comprises an operation:

5 (d) of chromatography of at least a part of the mother liquor obtained during crystallization operation (c), in order to produce a lactose-enriched fraction and a raffinate enriched in monovalent metal cations and possibly in
10 monovalent anions.

3. Method according to one of the preceding claims, characterized in that operation (a) of replacement of the multivalent cations comprises the processing of the whey or permeate with a cationic resin of which the
15 counter-ion is a monovalent metal cation.

4. Method according to one of the preceding claims, characterized in that operation (b) of replacement of the multivalent inorganic anions and organic acid anions comprises the processing of the whey or permeate with an
20 anionic resin of which the counter-ion is a monovalent anion non-able to form complexes with the multivalent cations.

5. Method according to claim 3, characterized in that the monovalent metal cation forming the counter-ion of
25 the cationic resin is the Na^+ or K^+ cation.

6. Method according to claims 4 or 5, characterized in that the monovalent anion forming the counter-ion of the anionic resin is the Cl^- anion.

7. Method according to claim 3, 4, 5 or 6, characterized in that it further comprises the operation:
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(e) of regeneration of the cationic resin and/or the anionic resin.

8. Method according to claim 7, characterized in that operation (e) of regeneration is performed with a
35 fraction of the mother liquor produced during crystallization operation (c).

9. Method according to claim 7 or 8, characterized in that operation (e) of regeneration is performed with a raffinate produced during chromatography operation (d).

5 10. Method according to any one of claims 7 to 9, characterized in that operation (e) of regeneration is performed in series or in parallel on the anionic resin and cationic resin.